On the identity of *Oberea formosana* Pic, 1911, with description of *Oberea pseudoformosana* sp. n. from China (Coleoptera: Cerambycidae)

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On the identity of *Oberea formosana* Pic, 1911, with description of *Oberea pseudoformosana* sp. n. from China (Coleoptera: Cerambycidae). - *Oberea pseudoformosana* sp. n. is described from mainland China. It differs mainly from the widely distributed Chinese and Oriental *O. formosana* Pic by longer legs and genital characters. *Oberea formosana* is also redescribed. Colour pictures of the habitus, head and abdomen, as well as drawing of genital characters are presented for the two species. *Oberea formosana* is recorded here for the first time from Bangladesh and India.

Keywords: Taxonomy - Phytoeciini - new species - new country record.

INTRODUCTION

Oberea formosana Pic, 1911 is widely distributed in Asia and China (Gressitt, 1951; Breuning, 1960-1962; Breuning, 1967; Kurihara & Ohabayashi, 2007; Hua et al., 2009; Löbl & Smetana, 2010).

In the frame of a taxonomic study of the *Oberea* from China and adjacent countries by the first author, we noticed that some specimens from mainland China keying out as *O. formosana* in the global key to *Oberea* species (Breuning, 1960) had unusually long hind legs. After detailed examination of their genitalia, we concluded that they belong to a distinct new species, which is described below. We take this opportunity to redescribe *O. formosana*, which is newly recorded here from India and Bengladesh.

MATERIALS AND METHODS

Material examined in this work (119 specimens) is deposited in the following collections (abbreviations as used in the text): China Agricultural University, Beijing, China (CAU), Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZAS), Musée des Confluences, Lyon, France (MHNL), Muséum d'histoire naturelle de la Ville de Genève, Geneva, Switzerland (MHNG), Muséum National d'Histoire Naturelle, Paris, France (MNHN), Natural History Museum, London, UK (BMNH), Northwest Agriculture & Forestry University, Yanglin, China (NWAFU), Southwest University, Chongqing, China (SWU), Zoologisches Forschungsmuseum Alexander

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Koenig, Bonn, Germany (ZFMK), Jianyue Qiu & Hao Xu Personal Collection, Chongqing, China (QCCC).

The infra-subspecific names *O. formosana* v. *ruficornis* Breuning, 1956, *O. formosana* v. *clarior* Breuning, 1960 and *O. formosana* v. *spinipennis* Breuning, 1960, were unambiguously introduced for infra-subspecific taxa that have subsequently not been raised to subspecific rank or higher until 1985; these names are thus unavailable (ICZN 1999: art 45.6) and treated accordingly. Nevertheless we made an effort to locate and examine types of theses taxa, which are listed below either under additional material when assigned to *O. formosana*, or as paratypes when assigned to *O. pseudoformosana*.

Measurements were taken dorsally and are defined as follows: Body length = distance between front of head and elytral apex, including spines; Body width = maximal width of elytra combined.

For detailed examination, genitalia were extracted from specimens softened in water, cleared in KOH, observed in water on glass microscope slides, then transferred into ethanol 70% and stored in capsules mounted on the same pin as the specimens. Drawings were made using a drawing tube mounted onto a compound microscope. Pictures are composites taken using a digital camera mounted onto a Leica MZ Apo dissecting microscope and subsequently processed using Automontage® software.

The label data of ancient material are reproduced verbatim between "", with our comments in []. Data pertaining to recent material are given in standard format, those from CAU, QCCC, NWAFU and SWU translated from Chinese to English.

Taxonomy

Oberea formosana Pic, 1911

Figs 1-3

Oberea formosana Pic, 1911: 20.

TYPE MATERIAL: Lectotype (3): "Taiwan, Formosa, IV" [handwriting], (MHNH), by present designation. – Paralectotype, 19, "Taiwan, Formosa, IV" (MNHN).

ADDITIONAL MATERIAL (69 specimens): BANGLADESH: 16, Sylhet (MHNG). -CHINA: **Taiwan**: 1 \mathbb{Q} , "Formosa" (MHNG). $-1\mathbb{Q}$, "Eboshiyama Formosa" 17-21.v.1933 (MHNG). $-1\mathbb{Q}$, "Shotoka Formosa, 10.v.1937, leg. T. Mitono" (MHNG). $-1\mathbb{Q}$ and $1\mathbb{Q}$, "Hori Formosa" (MHNL). - Chongqing: 1 &, Jinyunshan, Beibei, 20.v.2006, leg. Wang Zhijin (SWU). - 1 ♂, same data, but leg. Lou Binhai (SWU). - 3 ♂ ♂ and 1♀, same data but 8.vii.2006, leg. Wang Zhijin (SWU). -1 %, same data but 8.vii.2006, leg. Feng Bo (SWU). -2 % and 1 %, same data but 13.vi.2009, leg. Shi Shuqing (SWU). - 2♂♂ and 2♀♀, Xiangshuitan, Simianshan, Jiangjin, 1200m, 27.vii.1991, leg. Yin Youping (SWU). – 1 ♂ and 1♀, same data but leg. Wang Zhongkang (SWU). − 2 ♀ ♀, Dahonghai, Simianshan, Jiangjin 9.vii.2008, leg. Chen Li (SWU). - 19, same data but 9.vii.2008, leg. Shi Shuqing (SWU). - 19, Feilongmiao, Simianshan, Jiangjin, 14.vii.2006, leg. Song Yaqin (SWU). – 1 ♂, same data but 14.vii.2008, leg. Mu Hailiang (SWU). – 1 ♂, Dawopu, Simianshan, Jiangjin, 11.vii.2008, leg. Shi Shuqing (SWU). – 1♀, same data but 11.vii.2008, leg. Li Zhu (SWU). – 2♀♀, Simianshan, Jiangjin, 14.vii.2006, leg. Wang Zhijin (SWU). - Fujian: 299, Guadun, Cong'an, Fujian, 11-12.vii.1963, leg. Zhou Yao (NWAFU). – 2♀♀, Shaowu, Dazhulan, 16.vii.1963, leg. Zhou Yao (NWAFU). – Guangxi: 1♀, Jinxiu, Dayaoshan, 14.vi.1982, leg. Wang Xinli (CAU). – **Guizhou**: $2\delta \delta$, Xishui, 26.ix.2000, leg. Shi Fuming (SWU). – 1δ , same data but leg. Li Zizhong (SWU). – 1δ , Jinshagou, Chishui, 21-23.ix.2000 (SWU). – 1δ , Datangwan, Leigongshan, 11-viii.2006 (SWU). – 1, Leigongshan, 31.v-1.vii.2005, leg. Zhang Zhengguang (SWU). - 19, Linjiang, Chishui, 29.v.2000 (SWU). – **Hunan**: 3♀♀, Hengshan, 11.vii.1963, leg. Zhou Yao (NWAFU). – 1♀, Hupingshan, 1000-1200m, 15.vii.2012, leg. Qiu Jianyue and Xu Hao (SWU). - Jiangxi: 1♀,

DESCRIPTION

Male: Body (Figs 1a, b) 8.0-13.5 mm long and 2.0-2.5 mm wide, predominantly yellowish-brown to reddish-brown, except legs paler and apex of mandibles, hind tibiae and tarsi dark brown, and antennae with dark brown scape and slightly paler flagellum. Entire body and appendages clothed with short golden pubescence; presence of scattered dark hairs on undersides of basal antennomeres, and some erect yellow hairs on pronotum and elytra. Head, pronotal disc, metepisternum and sides of abdominal segments finely and densely punctured. Elytra with basal half of disc bearing six longitudinal rows of coarse and deep punctures, latter becoming gradually finer and disorganized towards apex.

Head nearly as long as wide, slightly wider than prothorax, with surface finely and densely punctured. Eyes very large, with inferior lobes 1.5 times longer than genae; depression between base of antennae and head with a medial groove. Antennae approximately 1.5 times longer than body; antennomeres ratio (from scape to apex): 4.9 - 1.0 - 5.5 - 9.2 - 9.1 - 8.6 - 8.3 - 7.8 - 7.7 - 7.1 - 5.5.

Pronotum in dorsal view about as long as wide, slightly constricted basally and apically, with lateral outlines arcuate in middle; apical and basal margins shallowly emarginated in middle; center of disc raised. Scutellum trapezoidal, with posterior margin shallowly emarginated in middle. Elytra approximately 4.5 times longer than combined humeral width, and 3.1 times longer than head and pronotum combined, in dorsal view slightly constricted on basal third; apex obliquely truncate with acute sutural and marginal angles. Posterior legs with femora reaching level of posterior edge of third abdominal ventrite (Fig. 1b) and tibiae approximately 1.6 times as long as tarsi.

Abdominal ventrite VII with shallow triangular medial depression extended on entire length (Fig. 2d).

Male genitalia: Tergite VIII densely clothed with short hairs, transverse, apex truncated and shallowly emarginated, broadly (Fig. 3a). Tegmen curved in lateral view, lateral lobes elongate and slender, dorsal surface mostly covered with long setae; base of each lateral lobe transversely and obliquely ridged ventrally, those ridges densely furnished with fine hairs (Fig. 3b-e). Median lobe 0.9 times as long as tegmen and curved in lateral view; median struts 2/3 as long as median lobe; dorsal plate slightly longer than ventral plate; ventral plate with apex rounded, and median foramen acutely angled (Fig. 3f). Endophallus with 2 pairs of slender subapical sclerities, longer pair



Fig. 1 Oberea formosana Pic. (a) Habitus, male, from Zhejiang, dorsal view. (b) Lateral view (scale bar = $1.0\,\mathrm{mm}$).

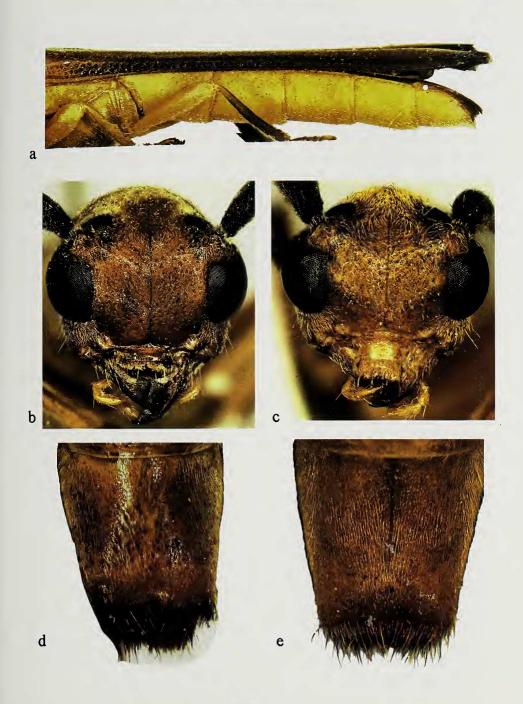


Fig. 2

Oberea formosana Pic. (a) Female, abdomen, lateral view. (b) Head of male, frontal view. (c) Head of female, frontal view. (d) Abdominal ventrite VII of male. (e) Abdominal ventrite VII of female (not to scale).

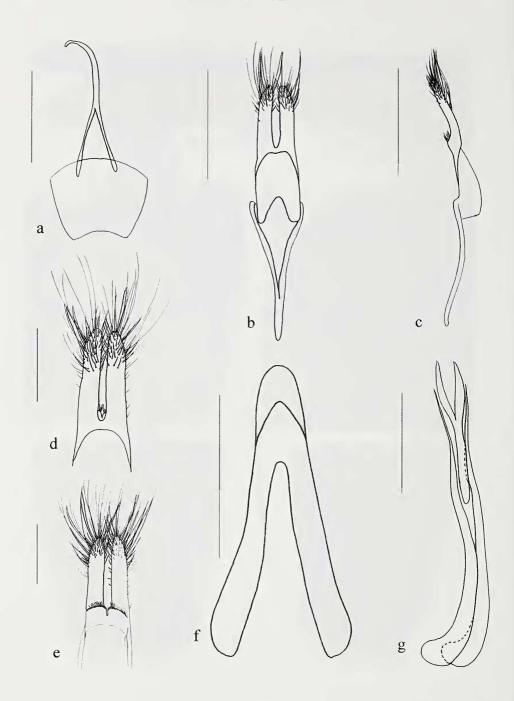


Fig. 3

Oberea formosana Pic. male genitalia. (a) Tergite VIII. (b) Tegmen, dorsal view. (c) Tegmen, lateral view. (d) Lateral lobes, dorsal view. (e) Lateral lobes, ventral view. (f) Median lobe, ventral view. (g) Sclerities in endophallus. (a, b, c & f: scale bar = 1.0 mm; d, e & g: scale bar = 0.5 mm).

very slender, baculiform, shorter pair fused at base and 2 times shorter than long one (Fig. 3g).

Female: Body 15.0-18.5 mm long and 2.0-3.0 mm wide. Frons wider than that of male (Fig. 2c). Inferior lobes of eyes 1.5 times as long as genae. Antennomeres ratio (from scape to apex): 4.5 - 1.0 - 5.3 - 7.9 - 7.9 - 7.5 - 7.4 - 6.9 - 6.6 - 6.3 - 5.8. Abdominal ventrite VII with a narrow medial groove (Fig. 2e).

DISTRIBUTION: Bangladesh (new country record), China (Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Zhejiang), India (Assam, West Bengal, Sikkim - new country record), Indonesia (Kalimantan), Malaysia (Sabah), Nepal, Korea, Laos, Myanmar, Thailand and Vietnam.

COMMENTS: In China, O. formosana and O. pseudoformosana are easily distinguished from other congeners by their body color pattern in combination with antennae measuring almost 1.5 times the body length and possessing the third antennomere shorter than the fourth. These two species differ however notably by the length of the posterior femora, and their male genitalia are also diagnostic.

The original description is based on an unspecified number of syntypes of both sexes. The two type specimens located in MNHN and here designated as lectotype and paralectotype are in moderate conditions, set dorsally with antennae partly missing.

Oberea pseudoformosana Li, Cuccodoro & Chen sp. nov.

Figs 4-6

HOLOTYPE: &, CHINA, Guizhou: Chishui, 29.v. 2000, leg. Li Zizhong (SWU)

PARATYPES (47): CHINA, Chongqing: 16, Simian shan, 14.vii.2006, leg. Feng Bo (SWU). - 1 o, Jiangjin, Simian shan, Chaqishan, 10.ix.2008 (IZAS, IOZ(E)1858301). - Fujian: 13, Wuyishan, Tongmuguan, 1100m, 28.vii.1997, leg. Youwei Zhang (IZAS, IOZ(E)1905164). –23319, Chongan, Xingcun, Sangang, 740m / 720-750m / 800m, 17/28.vii.1960 / 12.vi.1973, leg. Yirang Zhang, Peiyu Yu, Yong Zuo (IZAS, IOZ(E)1905165-167). –13, Chongan, Xingcun, Tongmuguan, 900m, 5.vii, 1960, leg. Yong Zuo (IZAS, IOZ(E)1905168). - 13 "Kuatun (2300m) 27.40n. Br. 117. 40ö. L. J. Klapperich, 14.vi.1938, Fukien [=Fujian]" (ZFMK), holotype of O. formosana v. ruficornis [unavailable name, see under Material and Methods, and under Comments]. −1 ♂, same data (ZFMK), paratype of O. formosana v. ruficornis [see comments]. - 12, same data but 17.vi.1938, (ZFMK), paratype of O. formosana v. ruficornis [see comments]. - 1 &, same data but 18.vi.1938 (ZFMK), paratype of O. formosana v. ruficornis [see comments]. - 13, same data but 19.vi.1938 (ZFMK), paratype of O. formosana v. ruficornis [see comments]. - Guangxi: 23 & 12, Longsheng, Huaping Cujiang, 8.viii.2006, leg. Meiying Lin (IZAS, IOZ(E)1905169-171). - 33 8, Jinxiu, Luoxiang, 400m, 14-16.v.1999, leg. Decheng Yuan (IZAS, IOZ(E)1905172-174). – Guizhou: 13, Jiangkou Fanjingshan, 520-2100m, 5.vii.1988, leg. Decheng Yuan (IZAS, IOZ(E)1905156). – 13, Jiangkou Fanjingshan, 550-850m, 16.vii.1988, leg. Shuyong Wang (IZAS, IOZ(E)1905157). – 1 $^{\circ}$, Jiangkou Fanjingshan, 530m, 12.vii.1988 (IZAS, IOZ(E)1905158). – 236, Fanjingshan, Huixiangping 1600m, 2.viii.2001, leg. Kangzhen Dong (IZAS, IOZ(E)1905159-160). - Hunan: 23 3, Shenjingdong, Mt. Hupingshan National Nature Reserve, Shimen, 30°01'28.69"N, 110°35'21.53"E, Alt. 800m, 15. vii. 2012, leg. Oiu Jianyue and Xu Hao (OCCC & MHNG). - 1♂2♀♀, Yongshun, Shanmuhelinchang, 600-900m, 8-9.viii.1988, leg. Shuyong Wang (IZAS, IOZ(E)1905152-154). - 13, same data but 600m, but 7.viii.1988, leg. Xingke Yang (IZAS, IOZ(E)1905155). -Sichuan: 19, Emei shan, 18.vi.2007, leg. Wang Zhijin (SWU). – 253, Youyang, Qinghualinchang, 1200m, 16.vii.1989, leg. Shuyong Wang (IZAS, IOZ(E)1905141-142). – 253, Emei shan, 29-30.vi.1955, leg. Huang & Jin (IZAS, IOZ(E)1905143-144). – 13, Emei shan, 25.vi.1955, leg. Keren Huang & Gentao Jin (IZAS, IOZ(E)1905151). - 2♂♂1♀, Emei shan, 2.vii.1955, leg. Keren Huang & Gentao Jin (IZAS, IOZ(E)1905145-147). -23 & 12, Emei



Fig. 4

Oberea pseudoformosana, sp. n. (a) Habitus, holotype, male, from Guizhou, dorsal view. (b) Lateral view (scale bar = 5.0 mm).

shan, Baoguosi, 550-750m, 14-22.vi.1957, leg. Zongyuan Wang (IZAS, IOZ(E)1905148-150). – **Zhejiang**: 23 31 9, Shunxiwu, Mt. Qingliangfeng National Nature Reserve, Lin'an, 25.vi. 2012, leg. Qiu Jianyue and Xu Hao (SWU). – 23 31 9, Tienmu shan, 21.vi.1936, leg. O. Piel (IZAS, IOZ(E)1905161-163).

DESCRIPTION

Male: (Figs 4a, b) 12.5-17.5 mm long and 2.0-3.5 mm wide. Body yellowish-brown to reddish-brown except apex of mandibles and tarsi dark brown, and antennae with reddish brown to dark brown scape and slightly paler flagellum. Entire body and appendages clothed with short golden pubescence; antennae with scatted dark hairs on

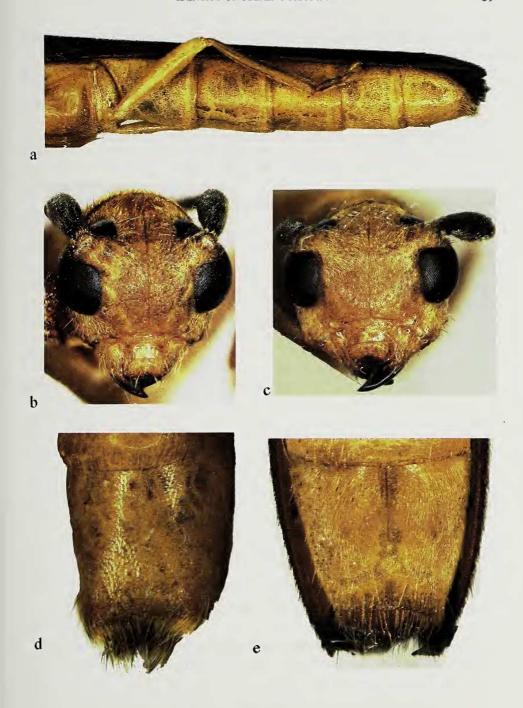


FIG. 5

Oberea pseudoformosana, sp. n. (a) Female, abdomen, lateral view. (b) Head of male, frontal view. (c) Head of female, frontal view. (d) Abdominal ventrite VII of male. (e) Abdominal ventrite VII of female (not to scale).

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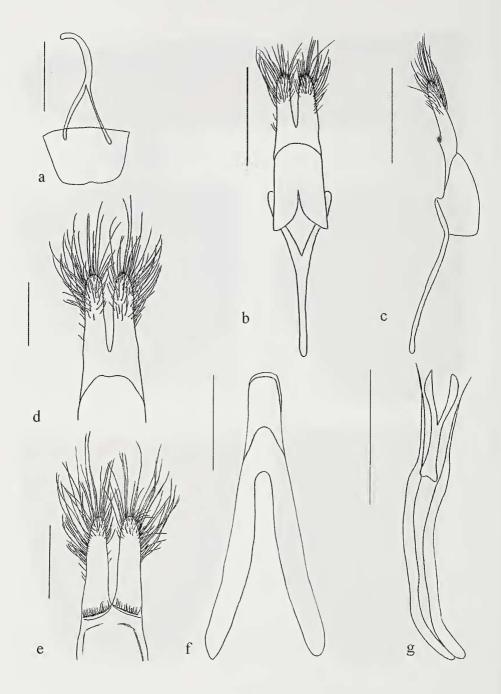


FIG. 6

Oberea pseudoformosana, sp. n. male genitalia (a) Tergite VIII. (b) Tegmen, dorsal view. (c) Tegmen, lateral view. (d) Lateral lobes, dorsal view. (e) Lateral lobes, ventral view. (f) Median lobe, ventral view. (g) Sclerities in endophallus. (a, b, c, f & g: scale bar =1.0 mm; d & e: scale bar =0.5 mm).

undersides of basal antennomeres, and some erect yellow hairs on pronotum and elytra. Head, pronotal disc, metepisternum and sides of abdominal segments finely and densely punctured. Elytra with basal half of disc bearing six longitudinal rows of coarse and deep punctures, latter becoming gradually finer and disorganized towards apex.

Head nearly as long as wide, slightly wider than prothorax. Eyes very large, inferior lobes 1.5 times longer than genae; depression between base of antennae and head with a medial groove. Antennae approximately 1.5 times longer than body; antennomeres ratio (from scape to apex): 4.0 - 1.0 - 5.5 - 6.8 - 6.5 - 6.4 - 6.4 - 6.3 - 5.9 - 5.4 - 4.9.

Pronotum in dorsal view about as long as wide, slightly constricted basally and apically, with lateral outlines accurate in middle; apical and basal margins shallowly emarginated in middle; center of disc raised. Scutellum trapezoidal, with posterior margin shallowly emarginated in middle. Elytra approximately 4.5 times longer than humeral width, and 3.5 longer than head and prothorax combined, in dorsal view slightly constricted from behind base to apical quarter; apex obliquely truncate with acute sutural and marginal angles. Posterior legs with femora reaching middle of fourth abdominal segment; hind tibiae 2 times longer than as tarsi.

Abdominal ventrite VII with a shallow triangular medial depression extended on entire length (Fig. 5d).

Male genitalia: Tergite VIII densely clothed with short hairs, transverse, apex truncated and shallowly emarginated in middle, bilobed (Fig. 6a). Tegmen curved in lateral view, lateral lobes elongate, wide at base, dorsal surface mostly covered with long setae; base of each lateral lobe transversely and obliquely ridged ventrally, those ridges densely furnished with fine hairs (Fig. 6b-e). Median lobe 1.1 times as long as tegmen and curved in lateral view; median struts 0.6 times shorter than length of median lobe; dorsal plate slightly longer than ventral plate; ventral plate with apex rounded, and median foramen rounded (Fig. 6f). Endophallus with 2 pairs of slender subapical sclerities, longer pair very slender, baculiform, shorter pair fused at base and 3 times shorter than long one (Fig. 6g).

Female: Body 17.5 mm long and 3-3.2 mm wide. Frons wider than that of males (Fig. 5c). Inferior lobes of eyes 1.2 times as long as genae. Antennomeres ratio (from scape to apex): 5.2 - 1.0 - 5.6 - 7.2 - 7.1 - 6.9 - 6.8 - 6.5 - 6.2 - 5.6 - 5. Abdominal ventrite VII with a narrow medial groove (Fig. 5e).

DISTRIBUTION: China (Chongqing, Fujian, Guangxi, Guizhou, Hunan, Sichuan, and Zhejiang).

COMMENTS: Oberea pseudoformosana share most characters in common with O. formosana, notably its colour pattern and particularly long antennae with shorted third antennomere. This new species has however longer posterior legs (reaching middle of fourth abdominal segment instead of just level of posterior margin of third segment) and hind tibiae usually yellowish brown (instead of dark brown) 2 times longer than tarsi (instead of 1.6 times), and fourth antennomere about 1.2 times longer than third instead of 1.5 times (in O. formosana). Other distinctive features are notably the conformation of the abdominal tergite VIII (with apex bilobed instead of broadly

emarginated) and of the male genitalia (ventral plate of median lobe with median foramen acute instead of rounded; lateral lobes of tegmen; long pair of sclerities in endophallus about 3 times longer that shorter pair instead of 2 times only).

Oberea formosana v. ruficornis Breuning, 1956 is an unavailable name (see Material and methods) which should be ignored. Nevertheless, the original description of this taxon refers to a male holotype and "zahlreiche" (= "numerous") paratypes collected by J. Klapperich in China ("Fukien [= Fujian]: Kuatun") on 3.VI.1938, while the data labels attached to the types located in ZFMK mention different collecting days. Despite these minor discrepancies, it is reasonable to assume that these specimens belong indeed to the original type serie.

ETYMOLOGY: The name refers to the easy confusion of the new species with O. formosana.

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